

# High Energy Groove

## Cosmic Quilt

**Level:** Middle and High school

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### National Science Education Standards:

(<http://www.nap.edu/readingroom/books/nse/html/index.html>)

*Science as Inquiry: Understandings about Scientific Inquiry (grades 5-8)*

-Current scientific knowledge and understanding guide scientific investigations. Different scientific domains employ different methods, core theories, and standards to advance scientific knowledge and understanding.

*Physical Science: Transfer of Energy (grades 5-8)*

- Energy is a property of many substances and is associated with heat, light, electricity, mechanical motion, sound, nuclei, and the nature of a chemical. Energy is transferred in many ways.

*Earth and Space Science: The Origin and Evolution of the Universe (grades 9-12)*

- Early in the history of the universe, matter, primarily the light atoms hydrogen and helium, clumped together by gravitational attraction to form countless trillions of stars. Billions of galaxies, each of which is a gravitationally bound cluster of billions of stars, now form most of the visible mass in the universe.

-Stars produce energy from nuclear reactions, primarily the fusion of hydrogen to form helium. These and other processes in stars have led to the formation of all the other elements.

### Objective:

Students will conduct research to create an informational fiction cosmic story and picture pieces to construct the Cosmic Quilt.

### Enduring Understanding:

There are a variety of objects in the universe composed of different materials and have different characteristics.

### Essential Questions:

What are the various objects in the universe and what are they composed of?

What are the characteristics of the various objects in the universe?

### Materials:

Construction paper

Scissors

Glitter

Glue

Markers, crayons, colored pencils

Any other art materials that you may wish to use

**Warm up:** Have students to finish the following statement. If I could go into deep space, I would like to visit \_\_\_\_?\_\_\_\_ because \_\_\_\_?\_\_\_\_.

Allow time for students to share their responses.

**Procedure:**

- Place students in groups of two.
  - Assign each group one of the following: Black Hole, Quasar, Supernovae, Neutron Star, X-ray Binary, Pulsar, Star, Sun, Cosmic Ray, White Dwarf, X-ray Transient, Gamma Ray Burst, Active Galaxy, Dark Matter, Rossi-XTE (or satellite), Earth
  - Each group must research (1-2 days) their assigned topic and create a picture piece and story piece on the construction paper (quilt piece). The picture would be on one quilt piece and the story on the second quilt piece.
  - The story should be typed or written in ink.
  - Encourage students to be creative in decorating their quilt pieces.
  - The center of the quilt will be the GALACTIC CENTER. Use a piece of bulletin board paper equal to the size of four pieces of construction paper. Post the galactic center and have each student to add something to the image.
  - Once all pieces are finished piece together the quilt and post on the bulletin board or wall. (see assessment)
- \*\*Make it look like a real quilt by “sewing” the pieces together with yarn or string.\*\***

**Assessment:** If this activity is done at the beginning of the unit students may give a 3-5 minute presentation on their piece of the quilt as you study each object. Students may also present their pieces with a 3-5 minute oral report and then secure (sew) their piece into the quilt.

**Extension:** This activity may also be done with other objects in the universe.

**Research web sites:**

[http://heasarc.gsfc.nasa.gov/docs/xte/learning\\_center/discover\\_0400.html](http://heasarc.gsfc.nasa.gov/docs/xte/learning_center/discover_0400.html)

<http://imagine.gsfc.nasa.gov/>

<http://starchild.gsfc.nasa.gov/docs/StarChild/StarChild.html>

[http://www.astrocappella.com/background/heg\\_background.shtml](http://www.astrocappella.com/background/heg_background.shtml)

### Example Cosmic Quilt Layout

Picture: Black Hole	Story: Black Hole	Picture: Quasar	Story: Quasar	Picture: Supernova	Story: Supernova
Story: Neutron Star	Picture: Neutron Star	Story: X-ray Binary	Picture: X-ray Binary	Story: Pulsar	Picture: Pulsar
Picture: Star	Story: Star	GALA CEN	CTIC TER	Picture: Sun	Story: Sun
Story: White Dwarf	Picture: White Dwarf			Story: X-ray Transient	Picture: X-ray Transient
Picture: Gamma Ray Burst	Story: Gamma Ray Burst	Picture: Dark Matter	Story: Dark Matter	Picture: Rossi-XTE (Satellite)	Story: Rossi-XTE (Satellite)
Story: Earth	Picture: Earth	Story: Active Galaxy	Picture: Active Galaxy	Story: Cosmic Ray	Picture: Cosmic Ray

Name \_\_\_\_\_ Date \_\_\_\_\_

### **Cosmic Research Guide**

Assigned cosmic object: \_\_\_\_\_

Composition:

Surface features:

Temperature range:

Relative size:

Average life span:

Observable characteristics:

Other interesting information:

Source #1: \_\_\_\_\_

Source #2: \_\_\_\_\_

Source #3: \_\_\_\_\_

Source #4: \_\_\_\_\_

\_\_\_\_\_